

Remarks

This is in response to the Office Action mailed on November 14, 2002. A substitute specification has been included herewith. Claim 5 has been canceled. Claim 1 has been amended to incorporate subject matter for canceled claim 5. No new matter has been added. Reconsideration and allowance are respectfully requested.

The specification was objected to because the facsimile copy of the specification was illegible for printing. A substitute specification, in accordance with 37 CFR 1.125(a), is included herewith that is sufficiently legible for printing. No new matter has been added. Removal of the objection is respectfully requested.

Claim 5 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claim 5 has been canceled, and the subject matter of claim 5 has been incorporated into claim 1. Removal of the rejection is respectfully requested.

Claims 1-3 and 5 were rejected under 35 U.S.C. § 102(b) as being anticipated by Gardner, U.S. Patent No. 2,920,874. This rejection is respectfully traversed, to the extent it is maintained.

Claim 1 is directed to a heat exchanger including a shell through which a first medium can be flowed under pressure. Claim 1 recites that a nest of tubes extend at least partly within the shell through which a second medium can be flowed in heat exchanging contact with the first medium. Claim 1 further recites that the individual tubes are each included with a supply and discharge side in tube bores extending substantially transversely to a plane of a tube plate included in the shell, wherein each of the tubes is connected with the tube-sided supply and discharge means via connecting channels located in the plane of the tube plate and crossing the tube bores, and wherein the tube plate comprises a flat body part with a number of the tube bores, corresponding to each tube, extending substantially transversely to the plane of the body part between a back face and a top face of the tube plate, and the connecting channels being located in the plane of the tube plate and crossing the tube holes.

Gardner discloses a heat exchanger including a pressure vessel with a cylindrical shell and a nest of tubes extending through the shell. The cylindrical shell is provided with tube sheets 4 that are transversed by the tubes. Outside the pressure vessel, partition walls 5 and partition members 6 are provided, which form compartments being closed by means of cover plates 9 and 54, or a combination of diaphragm plates 38 and back-up plates 40. The compartments are

accessible to supply and discharge means 12 and 13. The compartments disclosed by Gardner are not entirely surrounding by the tube sheets, but are instead formed by the tube sheets, partition members, and cover plates, so that a so-called D-head configuration is created. See page 1, line 14 - page 2, line 30 of the present application describing and noting the drawbacks of heat exchangers including the D-head configuration.

In contrast to Gardner, claim 1 recites that the individual tubes of the heat exchanger are each included with a supply and discharge side in tube bores extending substantially transversely to a plane of a tube plate included in the shell, wherein the tubes are connected with the tube-sided supply and discharge means via connecting channels located in the plane of the tube plate and crossing the tube bores. Claim 1 further recites that the tube plate comprises a flat body part with the number of tube bores, corresponding to each tube, extending substantially transversely to the plane of the body part between a back face and a top face of the tube plate, and the connecting channels being located in the plane of the tube plate and crossing the tube bores.

Gardner fails to disclose or suggest such a configuration as recited in claim 1. For at least this reason, claim 1, as well as claims 2 and 3 that depend therefrom, are allowable.

Reconsideration and allowance are respectfully requested.

Claims 1, 2, and 5 were rejected under section 102(b) as being anticipated by Vollhardt, U.S. Patent No. 3,229,762. This rejection is respectfully traversed, to the extent it is maintained.

Vollhardt discloses a heat exchanger with a first medium flowing through a pressure vessel 2 and a second medium flowing through tubes 3. The pressure vessel 2 is closed off on either side by means of block-shaped forgings 4 with projections through which are provided pipe borings in a direction perpendicular to the plane of the forgings. The tubes 3 are mounted to the pipe borings of the projections. Because the forgings 4 used in Vollhardt permit only a limited number of tubes in the pressure vessel due to the welding process of the tubes into the borings of the projections, each tube is split into two tube portions as it extends from the projections of the forgings. See Figure 1 of Vollhardt. This split of the tubing results in greater expense in the manufacture of the heat exchanger of Vollhardt.

In contrast, claim 1 recites that the individual tubes are each included with a supply and discharge side in tube bores extending substantially transversely to the plane of a tube plate, and that the tube plate comprises a flat body part with a number of the tube bores, corresponding to each tube, extending substantially transversely to the plane of the body part. Vollhardt does not

suggest that the number of tube bores, corresponding to each tube, be provided as recited in claim 1, since Vollhardt discloses only half the number bores for twice the number of tubes, since the tubes in Vollhardt are split as noted above.

For at least these reasons, Vollhardt fails to anticipate claim 1, as well as claim 2 that depends therefrom. Reconsideration and allowance are respectfully requested.

Claims 3 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gardner or Vollhardt in view of Kessler, U.S. Patent No. 1,621,742. This rejection is respectfully traversed.

Claims 3 and 4 depend from claim 1. Neither Gardner nor Vollhardt disclose all of the limitations of claim 1 for at least the reasons stated above. Kessler is cited solely for disclosing detachable plugs, a characterization that is not disputed for the purpose of this Amendment. However, the addition of Kessler fails to remedy the shortcomings of Gardner and Vollhardt. Therefore, claims 3 and 4 should be allowable for at least the same reasons that claim 1 is allowable. Reconsideration and allowance of claims 3 and 4 are respectfully requested.

In view of the above amendments and remarks, claims 1-4 are now in condition for allowance. Favorable reconsideration in the form of a Notice of Allowance is respectfully requested. The Examiner is encouraged to contact the undersigned attorney with any questions regarding this application.

Respectfully submitted,
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